Surveillance and Broadcast Services

Alaska Industry Council

By: Jere Hayslett, SBS Western Service Area Project Manager

Vincent Capezzuto, SBS National Program Office Manager

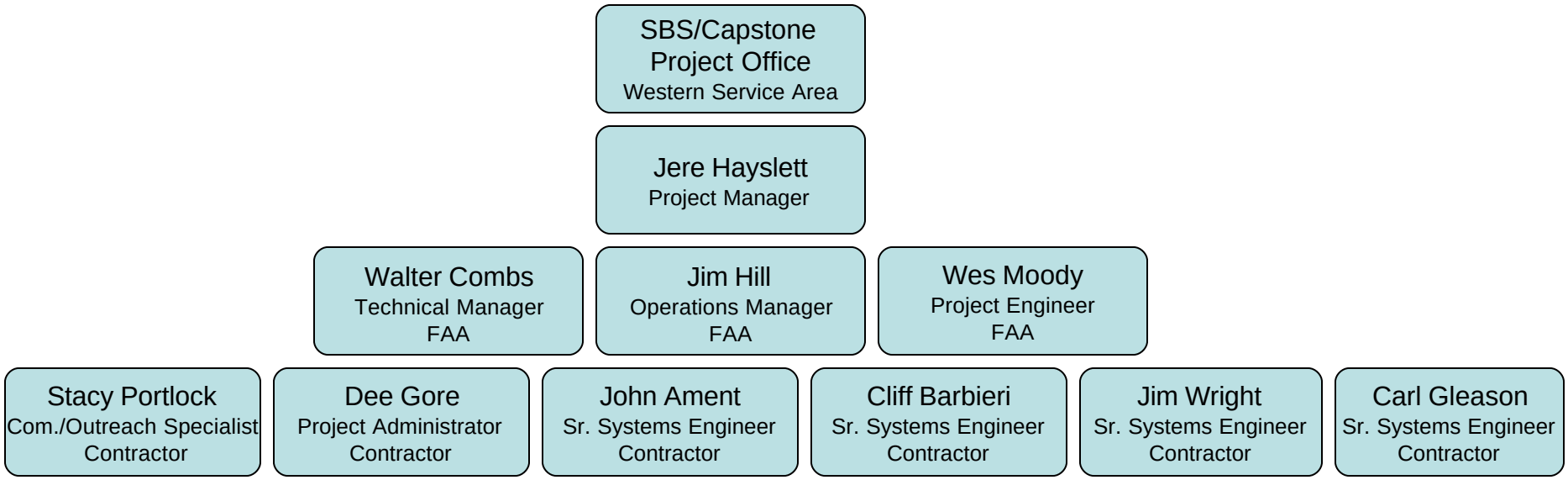
Date: August 8, 2007

Federal Aviation Administration

AGENDA

- Opening Remarks – Jere Hayslett
- National Program Update – Vincent Capezzuto
- MOA/AIC Update – Karen Casanovas
- Avionics Issues and Anomalies – Dan Stapleton
- Navigation Services Update – JoAnn Ford
- Operations Update – Jim Hill
- Technical Update – Walter Combs
- Round Table

Surveillance and Broadcast Office
Western Service Area Organizational Chart



Surveillance and Broadcast Services

Status Briefing

Vincent Capezzuto

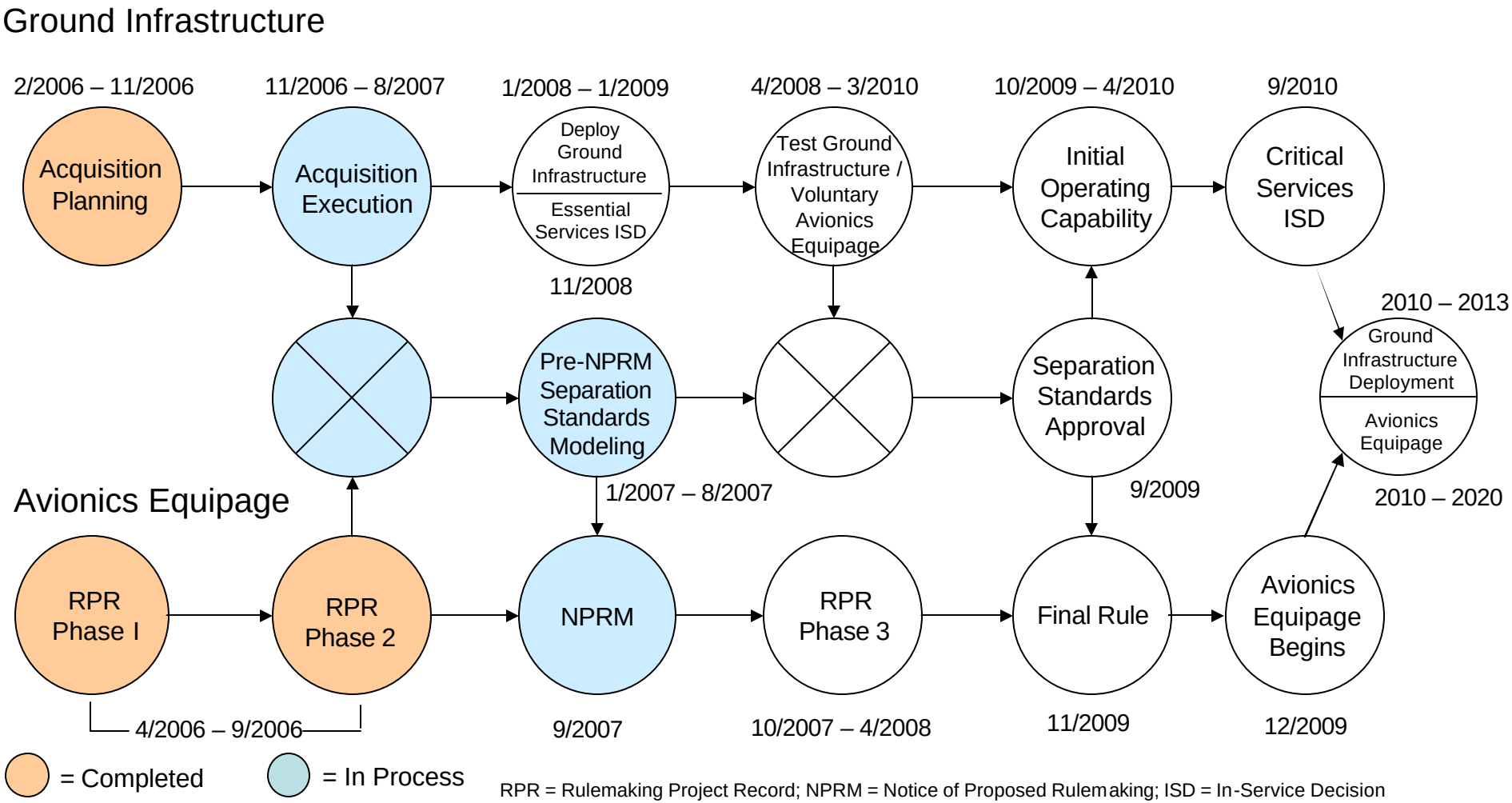
August 8, 2007

Federal Aviation Administration

Agenda

- Dual Track Strategy
- Acquisition Status
- Separation Standards Status
- Rulemaking Status
- Program Risks
- Next Steps

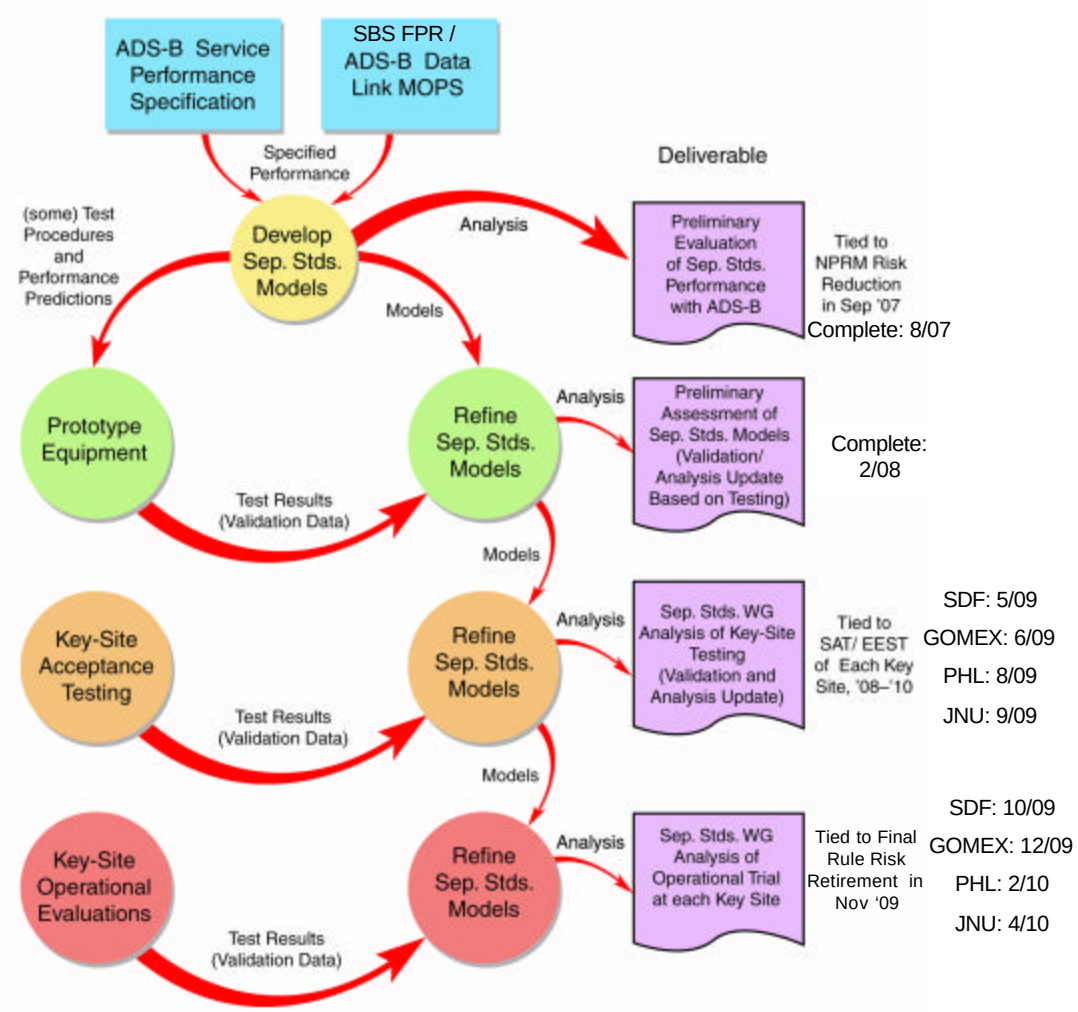
Dual Track Strategy



Acquisition Status: Schedule

Task:	Date / Status:
Release of Request for Offer (RFO)	March 30, 2007 / Complete
Business and Technical Responses Due	June 4, 2007 / Complete
Cost Proposals Due	June 20, 2007 / Complete
RFO Evaluation Complete (Business, Technical and Cost)	July 5, 2007 / Complete
RFO Final Report Completion	July 20, 2007 / Complete
Final Report Approval	July 27, 2007 / Complete
CIT Review	August 16, 2007
Executive Council Briefing	August 21, 2007
Joint Resource Council (JRC)	August 27, 2007
Contract Award	August 30, 2007

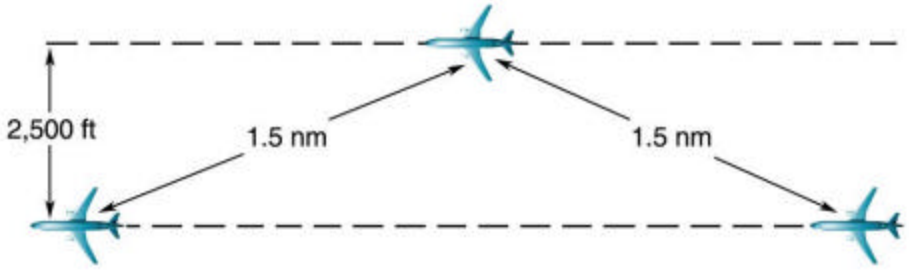
Separation Standards Planning for SBS



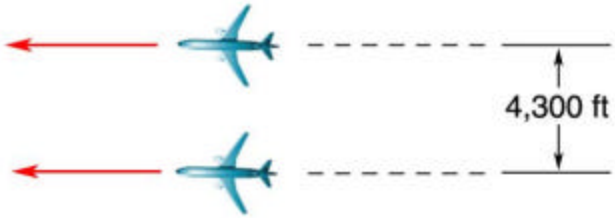
EEST = End to End System Test

- **Key Elements**
  - Modeling/Simulation: Model various systems and subsystems for SBS. Run simulations on models to determine viability of a separation standard.
  - Prototyping: Prototype components of system to validate and update models.
  - Testing: Test actual system to determine compliance with Sep. Standard
  - Operational Evaluation: Evaluate data in an operational setting to ensure performance supports a standard

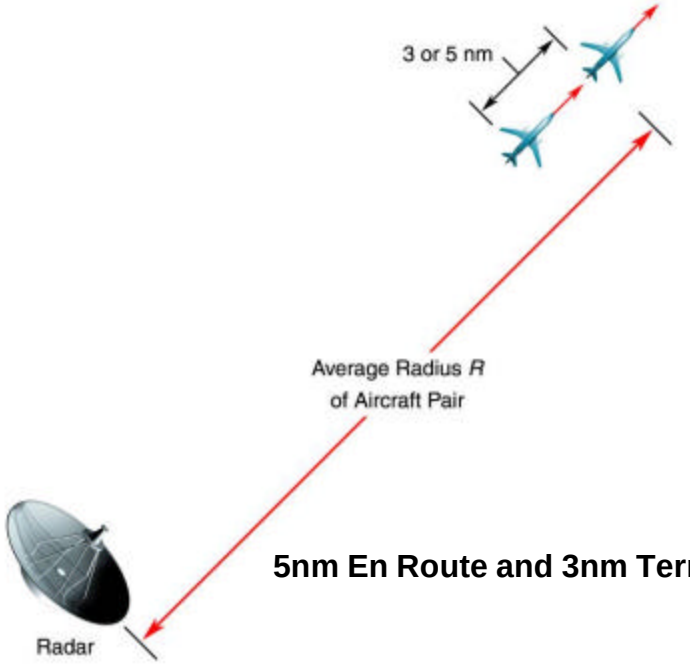
Separation Standards: Diagrams



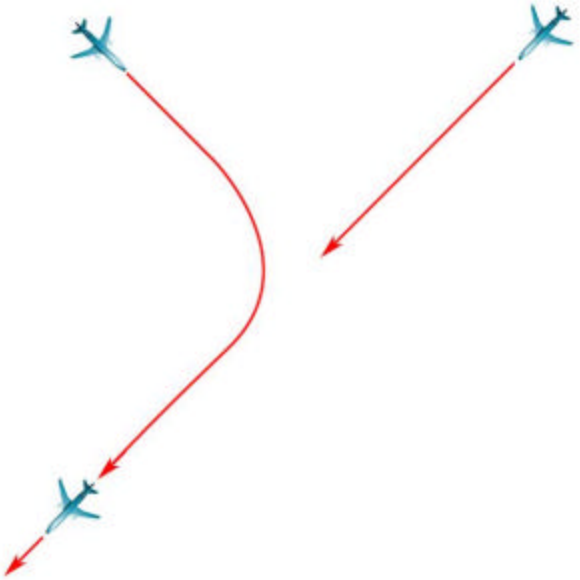
1.5nm Terminal on Staggered Dependent Approaches



4,300 feet on Independent Approaches



5nm En Route and 3nm Terminal



2.5nm on Approach

Separation Standards Activities

Task	En Route Sep. with HCS/ERAM	Terminal Sep. with CARTS	Terminal Sep. with STARS	En Route Sep. with MEARTS
Preliminary Analytic Modeling, including Close Approach Probability and Monte Carlo	6/18/2007	7/26/2007	7/26/2007	8/1/2007
Final NPRM Modeling	6/25/2007	8/1/2007	8/1/2007	8/14/2007
Model Results	6/30/2007	8/1/2007	8/1/2007	8/20/2007
Report on Results of Modeling and Simulation for Separation Standards Complete	September 2007 (tied to NPRM)			
Preliminary Modeling of WAM Systems	Apr 2008	--	--	Apr 2008
Assessment of WAM System Performance	May. / Aug. 2008			Sep 2008
Verification and Validation of Models	October 2008			
Assessment of ADS-B System Performance	Sep 2009	Aug 2009	Sep 2009	Sep 2009
Evaluation of Operational Trials at Key-sites	September 2010			

Rulemaking Status

Task:	Date / Status:
Preliminary Team Concurrence of NPRM	December 2006 / Complete
Economic Evaluation of NPRM	February 2007 / Complete
Final Team Concurrence (through Director level) of NPRM	May 2007 / Complete
Associate Level Concurrence of NPRM	May 2007 / Complete
ADA/AOA Approval of NPRM	May 2007 / Complete
OST Approval of NPRM (given standard 30 days as indicated in the rulemaking manual)	July 2007 / Complete
OMB Approval of NPRM (given standard 90 days as directed by Executive Order)	9/28/2007
Issuance	No later than September 2007

ARC Status

- **ARC Charter (FAA Order Number 1110.147) effective July 15, 2007**
  - Meetings held on July 26, 2007 and August 7, 2007
- **ARC Objectives**
  - While the NPRM is being finalized and leading up to its publication, the ARC will serve as a platform for developing a report on optimizing operational benefits of ADS-B prior to implementing a nationwide ADS-B airspace rule. Development of the report will not affect the release date of the NPRM.
  - After an NPRM has been published, the ARC will make specific recommendations to the FAA concerning the proposed requirements.

ARC Membership

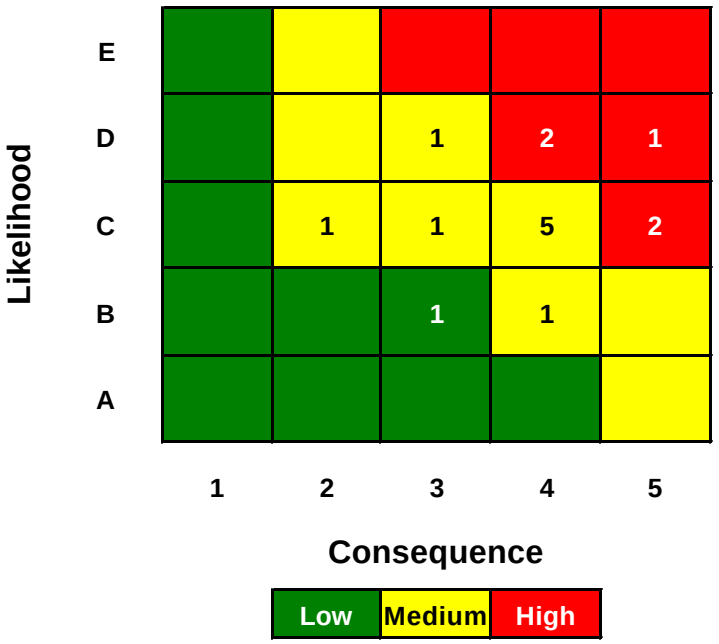
Name / Organization	Name / Organization
Basil Barimo; Co-Chair / ATA	Rick Heinrich / Rockwell Collins
Steve Brown; Co-Chair / NBAA	Bob Hilb / UPS
Vincent Capezzuto; Designated Federal Official / FAA SBS	Randy Kenagy / AOPA
Doug Arbuckle / JPDO	George Ligler / FAA SBS
Pete Bunce / GAMA	John McGraw / FAA AFS
Bruce DeCleene / FAA AIR	Jeff Mittleman / MITRE
Jim Duke / ALPA	Sam Seery / Garmin
Ken Dunlap / IATA	Allan Storm / DoD
Scott Foose / RAA	Tim Tuttle / Boeing
R. John Hansman / MIT	Dale Wright / NATCA

Program Status: Risks (as of 8/02/07)

15 Rated Risks: 5 High, 10 Medium

Next Risk Board: August 16

Risk Summary



High Risks

Risk #1: If NAS users demonstrate active opposition to avionics related airspace mandates, there may be delays in required rulemaking activities and/or the program may experience a reduction in benefits. (5C)

Risk #7: Without proper control of the 1090 MHz spectrum, the addition of SBS to the current environment may reduce the performance of ADS-B and other 1090 MHz systems, reducing benefits and system performance. (4D)

Risk #23: If ADS-B separation standards are not approved for currently equivalent separation standards, then the performance benefits of ADS-B may not be realized. (4D)

Risk #46: If FAA does not change flight plan format to accept multiple equipment codes, automation will not be able to distinguish between ADS-B equipped and non-equipped aircraft, and program ISD may be delayed. (5C)

Risk #52: If the existing implementation strategy for communications service does not support the baselined IOC date of September 2009, then the IOC for Communications in the Gulf of Mexico may be delayed until March 2010. (5D)

Source: SBS Risk Database

Next Steps

- **Contract Award: August 2007**
- **Separation Standards Risk Reduction (High to Medium): August 2007**
- **Continue iterative rulemaking process with the aviation community: August 2007**
- **Issuance of NPRM: September 2007**

Meeting objectives through transparent interaction between the aviation community and the FAA

Backup

Segment 1 Schedule

Milestone	Projected Completion Date	Complete
Segment 1 JRC	June 2006	v
Screening Information Request (SIR) Issued	November 2006	v
Segment 2 JRC	February 2007	v
Request for Offer Released	March 2007	v
Contract Award	August 2007	
NPRM Issued	September 2007	
Preliminary Design Review (PDR)	November 2007	
Critical Design Review (CDR)	February 2008	
Key Site Initial Operating Capability (IOC) of Broadcast Services	August 2008	
In-Service Decision (ISD) of Broadcast Services	November 2008	
Terminal Separation Standards Approval at Louisville	June 2009	
En Route Separation Standards Approval for Gulf of Mexico	July 2009	
Terminal Separation Standards Approval at Philadelphia	September 2009	
En Route Separation Standards Approval at Juneau	September 2009	
Gulf of Mexico Comm. and Weather IOC	September 2009	
Louisville IOC of Surveillance and Broadcast Services	October 2009	
Final Rule Published	November 2009	
Gulf of Mexico IOC of Surveillance and Broadcast Services	December 2009	
Philadelphia IOC of Surveillance and Broadcast Services	February 2010	
Juneau IOC of Surveillance and Broadcast Services	April 2010	
Surveillance and Broadcast Services ISD for ADS-B	September 2010	

Business Case Review: Proposed Schedule - Segment 2

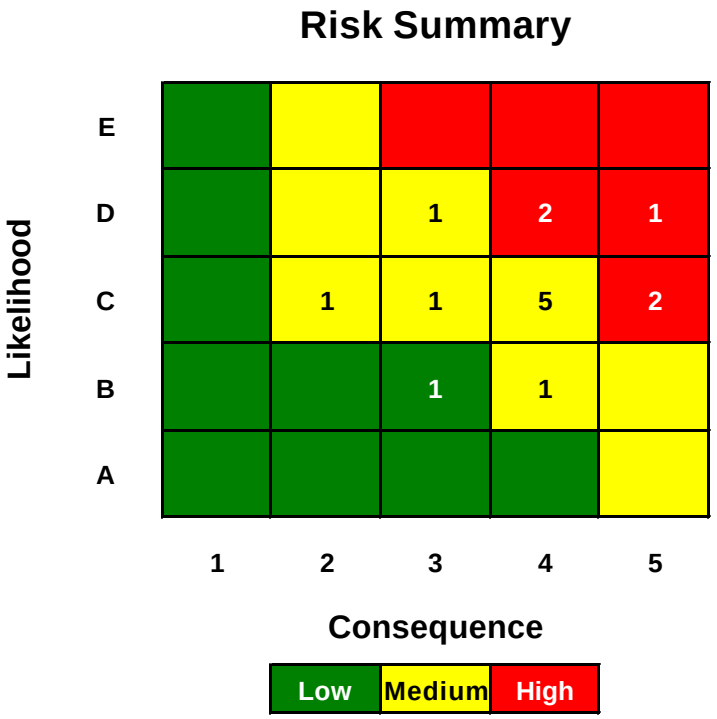
Milestone	Projected Dates
Segment 2 (2009 – 2014)	
Implementation:	
Continue Initial Aircraft to Aircraft Application Deployment	FY 2010 – FY 2014
Additional Aircraft to Aircraft Application Deployment	FY 2010 – FY 2014
Additional Aircraft to Aircraft Requirements Definition	FY 2010 – FY 2014
Continue / Complete TIS-B / FIS-B Deployment	FY 2009 – FY 2012
Continue / Complete ADS-B NAS Wide Infrastructure Deployment	FY 2010 – FY 2013
Complete 26% Avionics	FY 2014
Lifecycle:	
Targeted Removal of Legacy Surveillance	FY 2016 – FY 2020
Complete 100% Avionics	FY 2020
Complete Removal of Targeted Legacy Surveillance	FY 2023
Complete Targeted Removal of TIS-B	FY 2025

Note: Segments 3 and 4 will focus on the continued definition / deployment of additional aircraft to aircraft applications

Program Status: Risks (as of 8/02/07)

15 Rated Risks: 5 High, 10 Medium

Next Risk Board: August 16



Medium Risks

Risk #2: If avionics suppliers and installers are unwilling to accept investment risks, and/or are unable to ramp up ADS-B equipment production, certification and installation, then the avionics "industrial base" will lag user demand for ADS-B capabilities and make it difficult to meet the requirements of airspace mandates, and there will be a delay in benefits accrued to the Program. (4C)

Risk #3: If avionics meeting the applicable standards are unable to support SBS segment 1 applications, then the program goals will not be met and benefits of these ADS-B applications cannot be realized. (4C)

Risk #4: Standards for air-to-air applications approved in Segment 1are not complete. If there is a delay in standards completion which delays the equipage guidance, then accrual of benefits will be delayed. (3C)

Risk #36: Automation does not currently process and display ADS-B data to support ATC separation services. If automation is not modified to support ADS-B as a surveillance source in a manner that supports current separation standards, then the air traffic surveillance applications cannot be used. (4C)

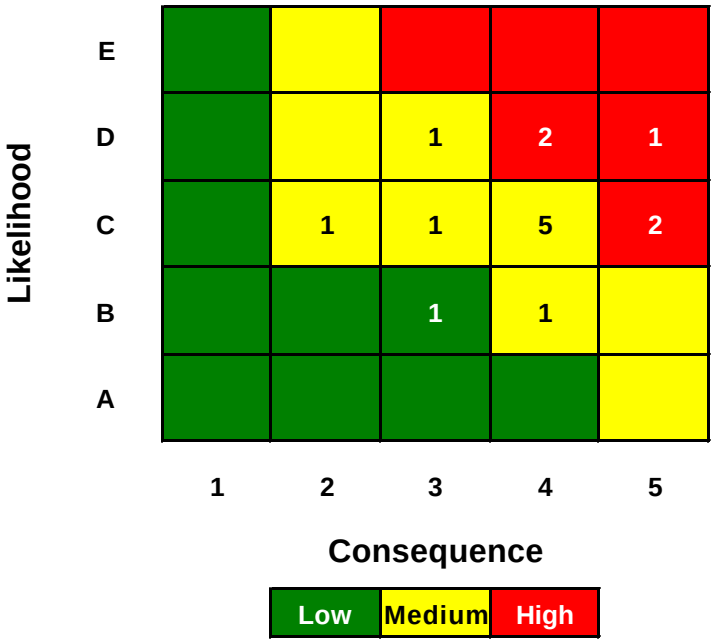
Source: SBS Risk Database

Program Status: Risks (as of 8/02/07)

15 Rated Risks: 5 High, 10 Medium

Next Risk Board: August 16

Risk Summary



Medium Risks (Cont.)

Risk #39: The process for approval for operational use for ACSS avionics for UPS aircraft to implement SafeRoute applications has not yet begun. If UPS does not receive operational approval according to the expected schedule, the benefits and ongoing analysis of these prototype applications will be delayed. (3D)

Risk #42: GOMEX helicopter operators are reluctant to accept investment risks, and/or are unable to begin equipping their helicopters with avionics in 2008 and 2009 due to program uncertainties. If the SBS Program Office does not have an adequate customer base, then the provision of services and IOC for the Gulf of Mexico during Segment 1 could be jeopardized. (4C)

Risk #45: If the Juneau Wide Area Multilateration (WAM) implementation and Micro EARTS update schedules are not achieved, SBS may fail to meet the Juneau IOC date of February 2010. (4B)

Risk #49: If, as result of lack of platforms and inability to utilize particular platforms in the SE Gulf of Mexico, the SBS program may be unable to provide seamless coverage for new East/West routes, reducing potential benefits. (2C)

Source: SBS Risk Database

Program Status: Risks (as of 8/02/07)

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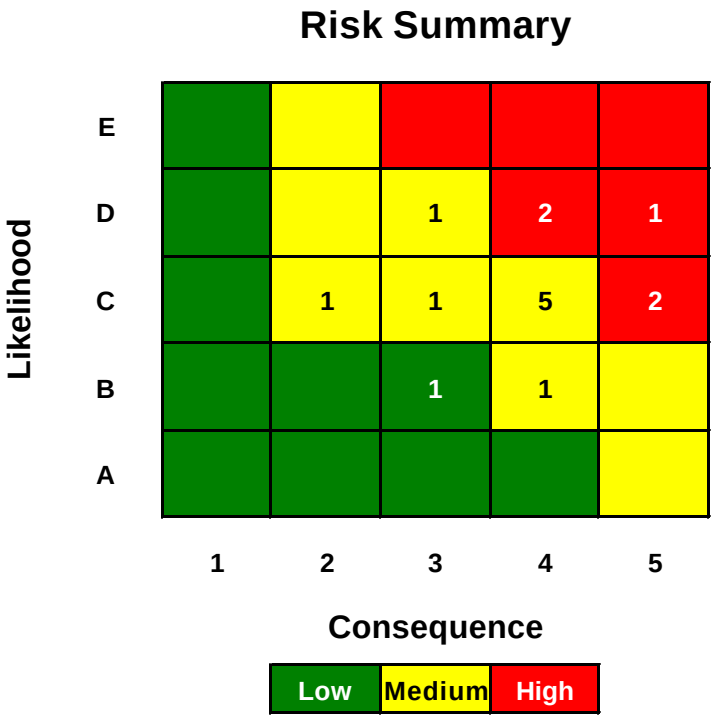

Medium Risks (Cont.)

Risk #50: If Wide Area Multilateration (WAM) separation standards are not approved for currently equivalent separation standards, then the performance benefits of multilateration may not be realized. (4C)

Risk #51: If the issue of the use of target aircraft flight ID in future ADS-B applications is not resolved, then requirements development work in the Requirements Focus Group (RFG) may be delayed and the benefits of future applications requiring the use of target aircraft flight ID may not be realized. (3B)

Source: SBS Risk Database

AIC UPDATE
Karen Casanovas
Industry Co-Chair

- **AIC continues to meet bi-weekly**
- **Site Implementation Team**
- **Avionics Equipage Team**
- **External Coordination Team**
- **Draft Plan v7.0**
- **FAA/Industry program to improve Alaska aviation safety and community access**

Action Update

- FAA Staff & Executive Level Briefing – 7/18
- Congressional Briefings – 7/19
- State DOT&PF Commissioner for Aviation – 7/19
- Governor's Aviation Advisory Board – 8/2
- Signing of Draft Plan – 8/8
- Determine Comprehensive List of Airports – ongoing
- Ground Deployment Schedule – ongoing
- Define Service Volume Areas & Re-evaluate GBTs and Benefit Information – ongoing
- Obtain additional signers to the MOA/AIC - ongoing

Avionics Anomaly Tracking and Resolution

- Key Accomplishments -

Dan Stapleton

August 8, 2007

Background - Origin

- **Regular telephone conference held since May 2003 to discuss and resolve Capstone avionics issues**
- **Issues dealt with operational and maintenance matters, software and hardware upgrades, as well as logistics and installation logistics matters**
- **Participants included the Capstone office; Alaska Region (Aircraft Certification, Flight Standards, Contracts); the Juneau and Fairbanks Flight Standards District Offices, Capstone avionics manufacturers; The University of Alaska; and the Capstone operators**

Key Issues Resolved

- **Chelton display unit**
  - **Display of misleading information on Juneau Runway 8 missed approach**
  - **Offers a selectable option for Juneau Instrument Flight Rules (IFR) departure that leads into terrain**
  - **Freezes or re-boots up to 15 seconds with total loss of guidance or navigation information to pilot**
  - **Obscures terrain features with red and yellow warning colors when flying near terrain**
- **Resolutions included Notices to Airmen (NOTAMS), Service Bulletins, changes to Aeronautical Radio Incorporated (ARINC) standards, software and hardware upgrades**

Key Issues - Continued

- **Shadin components**
  - **Air Data Computer (ADC) displays altitude errors**
  - **Fuel Flow Sensor Transducer - Unsupported wires subject to vibration and failure**
  - **ADC Mounting Bracket failures - potential for falling against battery terminals, causing fire**
  - **Fuel Flow Sensor mounting bracket failures**
- **Resolutions included Service Bulletins, new manufacturing or screening processes, repair and replacement**

Key Issues - Continued

- **Crossbow components**
  - **Attitude Heading Reference System (AHRS) produces erroneous bank information on Chelton displays**
  - **AHRS processes excessively in turns (as much as 40º)**
  - **Chelton display occasionally boots up with "Attitude Failure" warning after start-up in cold temperatures**
- **Resolutions included Service Bulletins, new manufacturing or screening processes, repair and replacement**

Key Issues - Concluded

- **FreeFlight Global Positioning System (GPS) components**
  - **Chelton display shows intermittent GPS “Loss of Integrity” followed by “GPS Failure” warnings**
  - **Resolutions included software and hardware changes**
- **Other**
  - **Various radios used for work with United States Forest Service occasionally interfere with GPS operation**
  - **Resolutions included tightening installation criteria compliance, advising/reminding operators of the potential for these radios to interfere**

Unresolved Problems

- **Chelton software upgrade to display Automatic Dependent Surveillance-Broadcast (ADS-B) and Traffic Information Service-Broadcast (TIS-B) tracks and Flight Information Service-Broadcast (FIS-B) weather information**
  - **Key software upgrade progressively delayed since Spring 2005**
  - **Software release (5.0D) was proposed and demonstrated in August 2005 in a University of Alaska C-172 with the ADS-B capability**
  - **New software version targeted (6.0B - to Level A compliance) and certification effort re-started; currently underway**
- **Shadin Outside Air Temperature probes failing**
  - **Unable, so far, to find consistent analysis of failures**

CENTER FOR ADVANCED AVIATION SYSTEM DEVELOPMENT

MITRE

OPERATIONAL UPDATE

- **Expansion of Surveillance Services**
  - No change in current status
- **Performance Based Navigation (PBN)**
  - Status
- **Avionics**
  - Installations Update (Dan Stapleton)

TECHNICAL UPDATE

- **State Wide**

  Deployment Initial Service Volumes July O7
  - Service Volume 6 (ANC-FAI), 11 (OME), and 13 (OTZ)
- **Southeast Phase II/Segment One**
  - Ground Stations
    - 7 sites fully operational providing Essential Services.
    - Final acceptance activities at CSP, AGN, WRG, QA5
      - Completion expected August 31, 2007.
    - Initial acceptance activities at QAA, QAY
      - Completion expected October 30, 2007
  - Wide Area Multilateration (WAM)
    - High level functional requirements being developed
    - Site selections complete
    - Site Engineering and Design in progress